

Week 10: Capstone Project Part 3.2_Salman_NUS

Replicate did not work,hence I am using Hugging Face for image models

```
!pip install diffusers transformers accelerate torch --quiet
```

```
363.4/363.4 MB 2.8 MB/s eta 0:00:00
13.8/13.8 MB 43.9 MB/s eta 0:00:00
24.6/24.6 MB 31.1 MB/s eta 0:00:00
883.7/883.7 kB 42.1 MB/s eta 0:00:00
664.8/664.8 MB 837.5 kB/s eta 0:00:00
211.5/211.5 MB 4.4 MB/s eta 0:00:00
56.3/56.3 MB 11.7 MB/s eta 0:00:00
127.9/127.9 MB 7.4 MB/s eta 0:00:00
207.5/207.5 MB 5.0 MB/s eta 0:00:00
21.1/21.1 MB 84.5 MB/s eta 0:00:00
```

```
from huggingface_hub import login
```

```
login(token= "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")
```

```
from diffusers import StableDiffusionPipeline
import torch
```

```
# 1. Load the model
pipe = StableDiffusionPipeline.from_pretrained(
    "runwayml/stable-diffusion-v1-5", # a well-known free model
    torch_dtype=torch.float16,
).to("cuda" if torch.cuda.is_available() else "cpu")
```

```
# 2. Define your prompts
prompts = [
    "a white siamese cat, studio lighting",
    "a white siamese cat, dramatic lighting, dark background",
    "a white siamese cat, outdoor setting, natural light"
]
```

```
generator = torch.manual_seed(42)
```

```
# 3. Generate and save images
for i, prompt in enumerate(prompts, 1):
```

```
    image = pipe(prompt, num_inference_steps=30, guidance_scale=7.5).images[0]
    filename = f"siamese_cat_{i}.png"
    image.save(filename)
    print(f"✅ Generated '{filename}' for prompt: \"{prompt}\"")
```

```
Loading pipeline components...: 100% 7/7 [00:22<00:00, 3.93s/it]

100% 30/30 [00:04<00:00, 6.65it/s]
✅ Generated 'siamese_cat_1.png' for prompt: "a white siamese cat, studio lighting"
100% 30/30 [00:04<00:00, 6.48it/s]
✅ Generated 'siamese_cat_2.png' for prompt: "a white siamese cat, dramatic lighting, dark background"
100% 30/30 [00:04<00:00, 6.35it/s]
✅ Generated 'siamese_cat_3.png' for prompt: "a white siamese cat, outdoor setting, natural light"
```

```
from google.colab import files
```

```
# Download each generated image
files.download("siamese_cat_1.png")
files.download("siamese_cat_2.png")
files.download("siamese_cat_3.png")
```

```
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import torch

# 1. Load the model
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]
```

```
generator = torch.manual_seed(50)
```

```
# 3. Generate and save images
for i, prompt in enumerate(prompts, 1):
```

```
    image = pipe(prompt, num_inference_steps=40, guidance_scale=7.5).images[0]
    filename = f"siamese_cat_{i}.png"
    image.save(filename)
    print(f"✅ Generated '{filename}' for prompt: \"{prompt}\"")
```

```
Loading pipeline components...: 100% 7/7 [00:22<00:00, 3.98s/it]

100% 40/40 [00:06<00:00, 6.86it/s]
✅ Generated 'siamese_cat_1.png' for prompt: "a white siamese cat, studio lighting"
100% 40/40 [00:06<00:00, 6.67it/s]
✅ Generated 'siamese_cat_2.png' for prompt: "a white siamese cat, dramatic lighting, dark background"
100% 40/40 [00:06<00:00, 6.53it/s]
✅ Generated 'siamese_cat_3.png' for prompt: "a white siamese cat, outdoor setting, natural light"
```

```
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```

```
# Download each generated image
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files.download("siamese_cat_2.png")
files.download("siamese_cat_3.png")
```

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Observations

Steps	Visual Quality	Detail	Sharpness	Noise	Time Taken
30	Moderate	Basic shapes visible	Some visible noise	Fast	
40	Good improvement	Better textures	Less noise	Slower	

Feature	Seed 42	Seed 50
Pose	Cat sitting upright, facing forward	Cat slightly turned or lying down
Facial Expression	Neutral or calm	Playful or more expressive
Lighting Style	Even studio lighting	Subtle contrast with shadows
Background	Clean, white or studio backdrop	Slightly textured or off-white tones
Color & Texture	Pure white fur, slightly warm tones	Slight blue-tint in shadows

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